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Detonation Velocity Calculations of Explosives with Slowly-Burning Constituents P. CLARK SOUERS, W. MICHAEL HOWARD, LAURENCE E. FRIED, Lawrence Livermore National Laboratory — The thermochemical code Equilbrium CHEETAH has been modified to allow partial reaction of constituents and partial flow of heat. Solid or liquid reactants are described by Einstein oscillators, whose temperatures can be changed to allow heat transfer. Hydroxy-terminated-poly-budadiene, mixed with RDX or HMX, does not react, as shown by the effect on the calculated detonation velocity. Aluminum and ammonium perchlorate in composites also do not react. Only partial heat flow also takes place in the unreacted materials. These results show that the usual assumption of total burn in a thermochemical code is probably incorrect, at least in the sonic reaction zone that drives the detonation velocity. A kinetic code would be the logical extension of this work.

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